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A series of shuttle vectors using chloramphenicol acetyltransferase as a reporter enzyme in yeast.

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Reports from numerous laboratories have shown that the gene coding for the bacterial enzyme chloramphenicol-3-O-acetyltransferase can be used as a reporter gene (cat) in mammalian and plant systems to analyze gene activity at the transcriptional level when combined with endogenous regulatory signals; the enzyme activity can be quantified by a chromatographic or a photometric assay. To adapt this simple and highly sensitive test for the yeast system, we constructed a series of yeast vectors containing the cat gene together with selectable markers for Escherichia coli and yeast; integrating, autonomously replicating and centromere-carrying plasmids were used. We show that the cat gene lacking the endogenous promoter is expressed at low levels in yeast transformants. To demonstrate functional expression of the cat gene placed under the control of a yeast promoter, we chose the PHO5 regulatory region. We found that cat expression was induced via the PHO5 promoter in a manner as observed for the endogenous PHO5 gene, whereas in the repressed state cat expression remained low. Using these vectors, it should be feasible to analyze other sequences conferring promoter activity or other control functions in yeast.

PMID: 3049257 [PubMed - indexed for MEDLINE]